Policy Research

WORKING PAPERS

Debt and International Finance

International Economics Department
The World Bank
September 1993
WPS 1180

The Financing and Taxation of U.S. Direct Investment Abroad

Harry Huizinga

A reduction in average tax rates on U.S. investment abroad and a relative shift of U.S. investment toward industrial countries, rather than developing countries, suggests a tougher climate ahead for developing countries that wish to attract foreign direct investment.

Policy Research

WORKING PAPERS

Debt and International Finance

WPS 1180

This paper — a product of the Debt and International Finance Division, International Economics Department — is part of a larger effort in the department to study the effect of taxation of foreign direct investment. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Rose Vo, room S8-042, extension 31047 (September 1993, 29 pages).

Huizinga examines the financing of U.S. direct investment abroad. Using a theoretical model, he first examines how home country investors can use debt finance to reduce their host country tax liability and to reduce the capital investment distortion attributable to foreign taxes.

Empirically, U.S. affiliates are shown to use leverage in high tax environments and in situations where the affiliates face high foreign wage bills relative to assets. This confirms the notion that leverage can be used to ward off host country tax and wage pressures on the firm.

Huizinga examines what characteristics of foreign direct investment determine the average host country tax rate paid. Generally, the taxation of foreign direct investment is positively related to the ratio of a firm's plant and equipment spending to its assets, and negatively related to the size of the wage bill. Host countries appear to charge lower taxes in cases where U.S. direct investors abroad pay high wage bills to labor within the host country.

Certain trends emerge from the data:

- There is a relative shift of U.S. direct investment abroad toward the industrial countries.
- Debt finance of direct investment is becoming more important in industrial countries and less important in developing countries.
- The tax benefits that industrial and developing countries get from U.S. affiliates, as measured by average income and payroll tax rates, are waning. The downward trend in tax rates suggests an increased international competition to attract foreign direct investment.

The reduction in average tax rates on U.S. investment abroad and the relative shift toward investment in industrial countries suggests a tougher climate ahead for developing countries that wish to attract foreign direct investment.

One strategy for attracting foreign investment would be to deepen the domestic financial market so a multinational can attract additional lending capital in the host country itself. Another approach is local equity participation in foreign direct investment to lessen the incentives for host countries to tax foreign investments highly.

Produced by the Policy Research Dissemination Center

THE FINANCING AND TAXATION OF U.S. DIRECT INVESTMENT ABROAD

Harry Huizinga[*]

Tilburg University

* This paper was written for the Debt and International Finance Division of the World Bank. The views expressed herein do not necessarily reflect those of the World Bank. I thank Lans Bovenberg and Antonio Estache for useful comments.

1. Introduction

With the decline in net direct lending to developing countries in the 1980s, foreign direct investment has gained in relative importance as a source of funds for investment in developing countries. Foreign direct investment itself, however, consists of debt as well as equity finance. This paper examines the joint determination of the affiliate's financing and in particular its leverage decision and of the rate of foreign taxation on the affiliate.

A theoretical model first examines the relationship between leverage, physical capital investment and taxation. The model is similar in spirit to work, pioneered by Jensen and Meckling (1976), that examines the implications of agency costs, stemming from conflicts between shareholders and managers, for the firm's financial structure. The firm is assumed to decide on its level of indebtedness before the country determines the tax rate. Leverage is then shown to moderate the level of taxation, as a highly leveraged firm cannot pay high taxes without risking bankruptcy. The tax authority wishes to prevent bankruptcy as it interrupts or stops the payment of tax. The model is an application to the area of international taxation of the general notion that debt finance reduces the ability of outside agents to capture the return to the firm's assets. The implication of the model that leverage moderates tax payments is consistent with the internationally widespread income tax deductibility of interest. The idea that the firm's financing affects the tax system is opposite to that of Hodder and Senbet (1990) who examine the firm's optimal global financing reacts to the provision of the international tax system.

The empirical research focuses on the determination of leverage and host country taxation for the case of U.S. foreign direct investment abroad. The data is at most disaggregated at the combined country and industry level. Debt finance is shown to be relatively important for U.S. affiliates in developed countries. Consistent with the theoretical model, leverage is positively related to the average tax rate. For the developed countries leverage is further positively related to the wage bill relative to sets in a country-level regression. This suggests that firms can use leverage to lessen pressures from tax authorities as well as from labor. For the developing countries, however, leverage does not appear to be

related to the tax and wage variables. Apparently for these affiliates bankruptcy is not an effective device for firms to moderate tax and wage pressures.

The multinational firm's international leverage decision is related to its choices regarding the extent and form of repatriated earnings. Earnings generally can be retained, or repatriated in the form of dividends, interest, royalties, etc. U.S. multinationals' earnings repatriation decisions have been a focus of previous empirical research. Kopits (1972) offers an early study that estimates dividend payout equations for subsidiaries to their U.S. parents using U.S. tax data aggregated at the country level. Hines and Hubbard (1990) and Altschuler and Newlon (1991) recently examined the impact of tax price effects on repatriation behavior using micro data, which makes it possible to examine the role of parent company characteristics in the determination of repatriation behavior.

A second empirical question the paper addresses is, what direct investment characteristics affect the host country rate of taxation? In this regard, the paper examines two measures of the average tax rate: (i) income and payroll taxes over assets and (ii) all taxes on the foreign establishment over assets. For the developed countries, it is the first tax rate that appears to reflect the characteristics of the foreign investment. In particular, the average tax rate is positively related to the ratio of plant and equipment expenditure to assets, and negatively to wages over assets. Apparently, the immobility of plant and equipment makes it easier for the tax authority to tax these assets. The latter relationship suggests that tax authorities to some extent undo the claims that organized labor lays on the returns to an affiliate's capital. For the developing countries it is the second measure of taxation, i.e. the ratio of all taxes to assets, that responds to the measures of the plant and equipment and the wage bill. Finally, for developed and developing countries, alike industry-effects are important. In particular, the petroleum industry is taxed the most relative to other industries.

The remainder of this paper is organized as follows. Section 2 sets out the theoretical model of the relationship between leverage and foreign taxation. Section 3 discusses the data and presents some regression results regarding leverage and taxation and Section 4 concludes.

2. The Model

This section presents a model of the role of debt finance in determining the level of host country taxation on foreign direct investments. The country is assumed to be unable to announce a rate of taxation that will hold regardless of the firm leverage decision. Host country taxation then will be responsive to firm leverage. The model is consistent with, and rationalizes the deductibility of interest expenses from taxable income in many countries. The host country income tax, throughout, is assumed to be the effective marginal tax on host country income. This is correct, if the multinational firm does not repatriate any earnings or if cannot obtain double taxation relief for host country taxes from its home country, for instance, it is in an excess credit position.

The model considers a single home country firm engaged in foreign direct investment. Each period the direct investor decides on the quantity of a single factor of production, denoted K, to be employed. K can generally be working capital, longer-term capital or labor. In what follows, K is referred to as capital. The cost of capital, K, per period is denoted r. Output per period is equal to $f(K) + Z$, where Z is a random profitability shock.[1] In particular, Z is a random variable on the interval $[\underline{Z},\bar{Z}]$, with density $g(Z)$ and a corresponding distribution function $G(Z)$. The host country taxes the firm's output at a rate τ. The cost of hiring the factor K is not deductible from host country taxable income, and hence the tax levied by the host country distorts the capital investment. The firm carries debt which all matures in a single period. The total payment, in units of output, due to creditors at the end of the period is denoted D. The host country tax authority is assumed to be the senior creditor. Net-of-tax output is also always assumed to be sufficient to pay for the cost of capital.

Generally, we will assume that there are costs of bankruptcy. The firm's scrap value, S, is, therefore, generally less than its no-bankruptcy value. The firm's value is the value of all the debt and equity claims on the firm's output, given the firm is presently not bankrupt. Bankruptcy is assumed to occur if the combined present period claims of the tax authority, the suppliers of capital, and the debt holders exceed the present value of firm's scrap value,

S, which will be fully realized one period after bankruptcy.[7] Bankruptcy, specifically, occurs if $Z \leq \hat{Z}$, where the threshold $\hat{Z}$ is given implicitly by

$$(1 - \tau)(f(K) + \hat{Z}) - rK + \frac{S}{1+r} = D \tag{1}$$

The firm's debt is assumed to be held by many creditors. In principle at the end of each period an individual creditor can decide to roll over the debt or to demand full payment. If all creditors believe bankruptcy is determined according to (1) then it is rational to demand full payment on the debt in bankruptcy states according to (1), and to be willing to roll over the debt in non-bankruptcy states. The bankruptcy rule (1), therefore, can be seen as a possible outcome in an environment where creditors do not coordinate their actions. Of course with $\hat{Z} < \underline{Z}$, bankruptcy cannot occur. Given the bankruptcy rule of (1), the per period probability of bankruptcy is given by $G(\hat{Z})$.

The value of the firm, before the profitability shock Z is known, is given by the expected net revenues this period plus the discounted value of the firm next period, expected across bankruptcy and non-bankruptcy states. Formally, the value of the firm, denoted $\hat{V}$, is given by

$$\hat{V} = V + \frac{\hat{V} - G(\hat{Z})C}{1 + r} \tag{2}$$

where

$$V = (1 - \tau)(f(K) + EZ) - rK$$

$$C = \hat{V} - S$$

and where EZ is the expected value of the productivity shock Z.

In (2), V is the expected value of per period net-of-tax operating profits. C is the cost of bankruptcy, given as the difference between the value of the firm in case of solvency and the scrap value of the firm.

Equation (2) can be solved for the firm's value $\hat{V}$ as follows

$$\hat{V} = \left[\frac{1 + r}{r}\right] V - \frac{C}{r} G(\hat{Z}) \tag{3}$$

Let us now consider the objective of the host country's taxation authority. We will simply assume the country is interested in maximizing the present discounted value of its tax receipts. The model thus sidesteps other possible government objectives such as the creation of consumer surpluys, labor rents or of technological spillovers.[3] The size of tax receipts in the current period are uncertain, as there is a random profitability shock Z. The tax authority, however, is the firm's most senior creditor, and receives at least some tax revenues this period. With bankruptcy the firm is liquidated so that tax payments cease altogether. This is of course an extreme assumption. We could assume, instead, that following bankruptcy the firm can be restructured after some time. In the latter case, production as well as tax payments are halted only for some periods following bankruptcy.

Let T be the host country's expected tax receipts per period if production takes place. T is given by

$$T = \tau(f(K) + EZ) \tag{4}$$

The expected discounted value of the country's present and future tax receipts is then given by

$$\hat{T} = \frac{1 + r}{r + G(\hat{Z})} T \tag{5}$$

Before we focus on the firm's and tax authority's decision making in detail, it is important to be clear about the exact order of events. We assume that, first, the firm sets the value of its debt D due at the end of the current period. Second, the tax authority selects the income tax rate τ.[4] Third, the firm decides on how much capital K to employ. Fourth, the

firm and the country observe the profitability shock Z. Ι..fth, the debt holders receive payments for their debts, and in the case of bankruptcy, foreclose on the firm. As is usual, we have to consider the outcomes of these decisions in a backward fashion. The bankruptcy decision is of course immediate for $Z \leq \hat{Z}$, with $\hat{Z}$ as in (1). What remains is to consider the firm's capital investment decision and the country's taxation decision in turn.

The Capital Investment Decision

At the investment stage, the firm's managers are assumed to be interested in maximizing the return to shareholders, rather than the value of the firm. The return to shareholders consists of expected net operating profits this period after debt repayment, in case of solvency, and the expected value of the firm next period. In particular, the firm's value to shareholders, $\hat{V}_s$, is given by

$$\hat{V}_s = \int_{\hat{Z}}^{Z} [(1 - \tau)(f(K) + Z) - rK - D]g(Z)dZ + \frac{1 - G(\hat{Z})}{1 + r} \hat{V} \qquad (6)$$

Note, that as the profitability shock Z is additive, there is no conflict at the capital investment stage between shareholders and debt holders.

The optimal investment level is given by the requirement that the net-of-tax return to capital equals its opportunity cost as follows

$$(1 - \tau)f'(K) = r \qquad (7)$$

Implicit in (7) is that investment K decreases with the tax rate τ.

The Tax Setting Decision

The host country tax authority sets the tax rate τ so as to maximize the discounted stream of tax revenues $\hat{T}$ in (5). The tax authority takes the negative relationship between the tax rate τ and investment K implicit in (7) as given. The optimality condition is found by

differentiating (5) with respect to τ as follows

$$\frac{dT}{d\tau} - \frac{T}{r + G(\hat{Z})} g(\hat{Z}) \frac{dZ'}{d\tau} = 0 \qquad (8)$$

with

$$Z' = \hat{Z} \text{ for } \underline{Z} \leq \hat{Z} \leq Z$$

$$= \underline{Z} \text{ for } \hat{Z} < \underline{Z}$$

$$= Z \text{ for } \hat{Z} > Z$$

such that

$$\frac{dZ'}{d\tau} = \frac{f(K) + \hat{Z}}{1 - \tau} \text{ for } \underline{Z} \leq \hat{Z} \leq Z$$

$$= 0 \text{ otherwise}$$

First, note that for the case where the tax setting does not affect the probability of bankruptcy, i.e $dZ'/d\tau = 0$, equation (8) implies $dT/d\tau = 0$ which means the tax authority maximizes current tax revenues T. For the case where the tax rate does affect the probability of bankruptcy, we have $dZ'/d\tau = (f(K) + \hat{Z})/(1 - \tau) > 0$. In this case (8) implies that optimally $dT/d\tau > 0$, which implies the tax rate is optimally chosen to be below the tax rate that maximizes current tax revenues.

The Leverage Decision

Finally, we have to examine the firm's borrowing decision. In particular, the firm chooses the value of its debt D so as to maximize the value of the firm in (3). Differentiating (3) with respect to D gives us the following optimality condition

$$\left[\frac{1 + r}{r}\right] \frac{dV}{d\tau} \frac{d\tau}{dD} - \frac{C}{r} g(\hat{Z}) \left[\frac{dZ'}{dD} + \frac{dZ'}{d\tau} \frac{d\tau}{dD}\right] = 0 \qquad (9)$$

with

$$\frac{dV}{d\tau} = -f(K) - EZ < 0$$

and

$$\frac{dZ'}{dD} = 1 \text{ for } \underline{Z} \leq \hat{Z} \leq Z$$
$$= 0 \text{ otherwise}$$

and $dZ'/d\tau$ as in (8).

The first term in (9) is the impact of leverage, via the tax rate, on current after-tax operating profits. The second term reflects that leverage affects the probability of bankruptcy directly and also through its effect on the tax rate τ. Important in (9) is the induced effect of leverage on the tax rate, i.e. $d\tau/dD$. The sign of $d\tau/dD$ is generally ambiguous. Specifically, for very low levels or high levels of debt, we have $d\tau/dD = 0$, as in these cases the firm will go bankrupt with probabilities zero and one respectively. In either case, the optimal tax rate from the tax authority's perspective will not be affected by a small change in indebtedness, D, by the firm.

What we wish to show, however, is that debt finance can always be used to lower the host country tax rate below the no leverage tax rate. To see this, let τ^* and K^* be the tax rate and capital investment, respectively, such that current tax revenues are maximized. The tax rate imposed in the absence of debt finance is τ^*. Let D^* be the highest level of debt such that with $\tau = \tau^*$ and $K = K^*$ there is no probability of bankruptcy. This means that D^* is given as follows

$$(1 - \tau^*)(f(K^*) + \underline{Z}) - rK + \frac{S}{1+r} = D^* \qquad (10)$$

Now let us consider a small increase in the firm's indebtedness beyond D^*. This increased indebtedness introduces the possibility of bankruptcy as now $dZ'/dD = 1$. Also, we now have $dZ'/d\tau > 0$. This means that from (8) the host country government has to lower its tax rate below τ^*. Lowering τ below τ^* has only a second order negative impact on current tax revenues as $dT/d\tau^* = 0$, but a first order effect in reducing the probability of bankruptcy. As a result, the government optimally lowers its tax rate to eliminate the probability of bankruptcy entirely. Increasing D slightly beyond D^*, therefore, does not introduce a probability of bankruptcy at all once the lower tax rate is taken into account. From (7) we know that the lower tax rate causes an increase in investment K. The net effect of this is, that with the lower tax rate and higher investment, there is only a second order negative impact on tax revenues. In sum, leverage can be used to lower the tax rate, increase investment and the value of the firm, with a negligible impact on tax revenues and no change in the probability of bankruptcy. This result does not depend on the magnitude of the cost of bankruptcy. The argument goes through, therefore, even if bankruptcy costs are very large.

The argument so far has been that some debt finance can always be used to lower host country income taxes on foreign direct investment regardless of the presence of bankruptcy costs. Of course, the optimal level of debt finance generally does depend on the existence of bankruptcy costs. Specifically, the presence of high bankruptcy costs should reduce the case for debt finance as a means of lowering the firm's tax liability. This generally produces an optimal interior level of debt finance. Interestingly, however, the optimal use of debt finance in the absence of bankruptcy costs is, also, generally interior. Specifically, in the absence of bankruptcy costs leverage should be chosen so as to render the probability of bankruptcy very senstive to the tax rate. The expected present value of future tax revenues are then, also, very sensitive to the tax rate, and the authorities face a large incentive to lower the tax rate.

The financing choice highlighted above is the use of debt finance. A separate, and perhaps equally important aspect, is the national source of all types of financing. The international ownership structure of a foreign affiliate affects the country's taxation decision

as the country, other things equal, is more interested in taxing foreign citizens than its own citizens.[5] Knowing this, firms have an incentive to indigenize their operations by borrowing in the country of location as well as by selling equity shares to local investors. Bradley (1977) mentions divestment to local investors as a strategy for multinationals against expropriation. Host countries generally have an incentive to facilitate this process as it forces foreign firms to divest partially. Regulation of this kind is desirable if the foreign investors individually are too insignificant to influence the rate of taxation of foreign investments. Ownership restrictions of this variety allow a host country to precommit to a low rate of taxation on foreign investment ex post. Such restrictions potentially benefit all parties, as they can simultaneously increase host country tax receipts, foreign capital investments and after-tax value of the home country's foreign investments. Ownership restrictions are a policy prevalent in many countries.

Ownership restrictions alter the interaction between the affiliate and the parent, as well as between the affiliate and the host country tax authority. The former aspect of ownership restrictions is examined by Katrak (1983). In this regard, ownership restrictions are undesirable if they induce the multinational firms to transfer profitable activities back to the parent or to subsidiaries in other locations.

3. The Evidence

The Data

The U.S. Commerce Department collects data separately for majority-owned and minority-owned U.S. affiliates abroad. Data collection for majority-owned affiliates tends to be more detailed. Data is further collected separately for bank and non-bank affiliates. Reflecting data availability and the interest of this study, all data in this paper are for majority-owned non-bank U. S. affiliates abroad.

The U.S. Commerce Department has covered virtually all affiliates in its benchmark surveys of 1977, 1982 and 1989. The 1977 and 1982 survey data at this point are available in final revised form, while the 1989 data are currently available only in preliminary form. As a

result, most of the information in this paper and in particular the regression analysis is based on the 1982 benchmark survey. During non-survey years, the Department collects less extensive information from smaller samples of affiliates. The results of these surveys are available in revised form up to 1988.

Table 1 first reports how the size of U.S. foreign direct investment, as measured by assets, has changed during the 1980s. It shows that U.S. investment in the developed countries more than doubled in assets from 1982 to 1989, which amounts to an increase in real terms of around 58 per cent. U.S. direct investments in the developing countries instead declined by around 6 per cent in real terms.[6] This evidence shows that, at least for U.S. foreign direct investment, there has been a trend towards relatively less investment in the developing countries.

Table 2 provides information on trends regarding the tax and employee compensation benefits host countries receive from U.S. foreign investment. The T/A and T/I variable are host country income plus payroll taxes over assets and over before-foreign-tax income (and also before interest is deducted). Interestingly, for developed and developing countries alike, tax revenues as a percentage of assets, as well as before-tax income, have declined. In absolute terms, tax revenues have increased from $17.3 billion in 1982 to $20.2 billion in 1989 for the developed countries, while they have declined from $12.7 billion to $8.4 billion for the developing countries. The general decline in tax rates, and in absolute tax revenues for the developing countries, suggests that tax competition to attract foreign direct investment has become fiercer in the 1980s. The L/A variable measures affiliate liabilities divided by assets. The table shows that this ratio has increased somewhat from 0.63 to 0.65 for the developed countries, while it has declined from 0.58 to 0.49 for the developing countries. In this respect investments in developed and developing countries are thus becoming more dissimilar. P EXP/A stands for plant and equipment expenditures divided by assets. Here the ratio has declined for the developed countries, from 0.30 in 1982 to 0.23 in 1989, while it has increased from 0.19 to 0.23 for the developing countries. These trends suggest a general shift of plant and equipment from developed countries to developing countries. The W/A variable

stands for total employee compensation divided by assets. This measure of host country compensation has declined for developed and developing countries alike. The tax and wage data together suggest host countries, and especially developing countries, are receiving progressively fewer direct benefits from the presence of foreign direct investment.

Table 3 provides information on how U.S. foreign direct investment differed by industry for 1982. First, payroll and income tax rates are highest in the petroleum industry, followed by manufacturing and wholesale. Lowest taxes are paid by the finance and service industries. The least leveraged industry is manufacturing, while the most highly leveraged is finance. High-tax industries tend to have high plant and equipment expenditures as a share of assets. Apparently, the presence of fixed capital assets enables tax authorities to raise the average rate of taxation. High tax payments also appear to coexist with high employee compensation relative to assets. Apparently, the same factors that allow tax authorities to extract tax payments allow labor to bargain for its compensation. Secondly, the last column provides information on research intensity, as measured by the volume of research and development expenditure for the affiliate divided by affiliate assets.[7] The manufacturing industry is shown to be the most research intensive.

Of course, the information, as presented in the table, does not allow us to infer precisely the relationships between financial structure and taxation. To address these questions, we next present the results of regressions that attempt to explain the financial structure choice of the U.S. multinational, on the one hand, and the country's taxation decision on the other.

Regression Results

To start, Tables 4 and 5 examine the leverage decision for U.S. foreign affiliates. [8] The regressions in Table 4 result from ordinary least squares. The country's taxation decision, however, is argued in Section 2 to be endogenous to the firm's leverage decision. To adjust for this, Table 5 reports two-stage-least-squares regression results, where the P EXP/A variable is used as the instrument for the T/A variable. The data are aggregated to the host country level. The dependent variable is the ratio of affiliate liabilities to assets. Column 1

includes all countries in the sample, while columns 2 and 3 are for the developed and developing countries separately. The results in the two tables are very similar.

Overall it appears that higher average taxes induce U.S. firms to increase leverage, at least for developed countries. This is consistent with the theoretical model, but also with the simple rule of the deductibility of interest from taxable corporate income. The other generally significant variable is the wage bill to assets ratio--W/A. Higher employee compensation relative to assets is thus associated with higher leverage. An explanation is that firms use leverage to reduce the firm's free cash flow which can be captured by organized labor.[9] The higher is employee compensation, the higher are the firms' incentives to use leverage to reduce labor's scope for increasing demands for compensation. Note that in both Tables 4 and 5 the regressions appear to explain leverage fairly well for the developed countries but not so well for the developing countries.

Regression results regarding the firm's leverage decision with data disaggregated at the country and industry level are reported in Table 6. The industry dummies I2 through I6 are included to examine fixed industry effects. The base industry is the petroleum industry. The host country tax and wage pressure variables are significant as before, at least for the developed countries. Plant and equipment, proxied by the P EXP/A variable, is associated with less debt and thus more equity finance.[10] The I5 and I6 dummies are significant for the developed countries, meaning that the services and other industries categories use less leverage.

Next we turn to the results of regressions explaining the host country's taxation decision. The regressions reported in Table 7 again are for data aggregated at the host country. The dependent variable is the ratio of income and payroll taxes to assets. The advantage of deflating tax revenues by assets rather than income is that it sidesteps issues of defining income. Deflating tax revenues by assets is, also, consistent with the definitions of the right-hand-side variables in the regressions. The theory suggests the L/A variable is not a truly exogenous variable, and the variable is left out. The P EXP/A variable enters significantly

throughout, while the W/A variable is negative and significant for the group of developed countries only. The generally better fit for the developed countries suggests that at least payroll and income taxes reflect foreign direct investment characteristics foremost in the developed countries.

As an alternative to the income and payroll tax measure, we can define the average tax rate, as all host country taxes on the U.S. foreign establishment divided by assets. This measure of taxation possibly reflects sales taxes, export taxes and tax-like user fees as well income and payroll taxes. Table 8 presents regressions of this alternative average tax rate using country data. Interestingly, the all-inclusive tax rate regression does well only for the group of developing countries. It appears, therefore, that the developing countries use non-income and payroll taxes to establish the desired effective rate of tax on foreign direct investment. The relative responsiveness of non-income and payroll taxes in developing countries to foreign direct investment cannot be a consequence of their overall heavier use in the developing countries, as the average non-income and payroll tax in developing countries is around 6 per cent in the developing countries, while it is 11 per cent in the developed countries.

4. Conclusion

This paper has examined the financing of U.S. direct investment abroad. The financing decision has been examined in conjunction with the host country's problem of taxing the foreign direct investment. Host country taxation and wage pressure variables are shown to be important for the determination of affiliate leverage only for the developed countries. U.S. direct investment in developing countries is generally more equity-financed than investment in the developed countries. In the case of developing countries, the threat of bankruptcy may therefore be small, and debt finance cannot be effectively used by the firm to lower tax and wage pressures. A reason for the relatively unimportant debt finance in developing countries can be the lower level of development of internal credit markets.[11]

Average payroll and income rates of taxation differ widely across industries, with the petroleum industry being taxed the highest, followed by manufacturing and wholesale. The petroleum industry also pays the highest non-income and payroll tax taxes.[12] The finance and services industries, on the other hand, face lower tax rates. Consistent with these stylized facts, the ratio of plant and equipment expenditures to assets positively affects the average rate of taxation. At the same time, host countries appear to charge lower taxes in cases where U.S. direct investors abroad pay high wage bills to labor within the host country. In developing countries, non-income and payroll taxes appear to respond relatively strongly to the qualitative nature of U.S. direct investment abroad.

Two main trends emerge from the data. First, there is a relative shift of U.S. direct investment abroad towards the developed countries. Second, debt finance of direct investment is becoming more important in developed countries and less important in developing countries. More importantly, the tax benefits that developed and developing countries obtain from U.S. affiliates, as measured by average income and payroll tax rates, are waning. Average tax rates on U.S. investments in developing countries dropped discretely in 1986 at the time of the U.S. Tax Reform Act. The decline in the developed countries, however, has been more gradual. The downward trend in tax rates suggests that there is increased international tax competition to attract foreign direct investment. Income and payroll tax revenues that developing countries derive from U.S. investment have been also declining in absolute terms. The wage bill relative to assets that U.S. firms abroad have been paying has also been declining. Of course, tax and wage benefits are not all that multinationals can contribute to a host country. Also of importance are the introduction of new products and the transfers of new technologies. The relative shift of plant and equipment expenditures from developed to developing countries suggests that the transfer of production technologies to the developing countries is on the increase.

The reduction in average tax rates on U.S. investment abroad and the relative shift towards investment in the developed countries suggests a relatively tougher climate for developing countries that wish to attract foreign direct investment. In order to successfully

attract foreign investments, developing countries can develop various strategies.

The theoretical analysis suggests that more plentiful borrowings by the multinational allow the multinational to reduce the effective rate of taxation on foreign direct investment. One approach, therefore, is to deepen the domestic financial market to enable a multinational to attract additional lending capital in the host country itself. In this regard the existence of financial intermediaries that can channel local savings to international companies and a legal framework that protects the rights of lenders are important.

Along similar lines, local equity participation in foreign direct investment should lessen the incentives for host countries to tax foreign investments highly ex post. Indigenization of the ownership of foreign affiliates can be encouraged by way of regulation, as is done in many countries that have restrictions on the foreign ownership of domestic firms or affiliates. In this regard, ownership restrictions may have a useful role to play in environments where countries cannot commit to the effective rates of taxation on future foreign direct investment. Ownership restrictions are a trade-related investment measure that is subject to negotiation in the current GATT round. In these negotiations, the United States has generally advocated the proscription of this and other trade-related investment restrictions.[13]An empirical investigation of the relevance of international ownership patterns in the determination of the rate of taxation on international investments would be an interesting research step to consider. Unfortunately, published data on the international ownership of foreign investments by U.S. parents is only available at a highly aggregated level, which makes a careful examination of this link rather difficult.

Altshuler, Rosanne, and T. Scott Newlon, "The Effects of United States Tax Policy on the Income Repatriation Patterns of United States Multinational Corporations," NBER WP No. 3925, 1991.

Bradley, D., "Managing Against Expropriation," Harvard Business Review 55, 75-83, 1977.

Hines, James R. and R. Glenn Hubbard, "Coming Home to America: Dividend Repatriations by United States Multinationals," in A. Razin and J. Slemrod, eds., Taxation in the Global Economy, University of Chicago Press, Chicago, IL, 1990.

Hodder, James and L. Senbet, "International Capital Structure Equilibrium," Journal of Finance 4
5, 1495-1516, 1990.

Graham, Edward and Paul Krugman, "Trade-Related Investment Measures," in Completing the Uruguay Round, A Results-Oriented Approach to the GATT Trade Negotiations, Jeffrey Schott, Editor, Institute for International Economics, Washington, D.C., 1990.

Huizinga, Harry, "Fiscal Intervention in the Unionized Sector," mimeo, Tilburg University, 1991a.

Jensen, Michael C. and William Meckling, "Theory of the Firm: Managerial Behavior, Agency Costs, and Capital Structure," Journal of Financial Economics 41, 93-105,

1976.

Katrak, H., "Multinational Firms' Global Strategies, Host Country Indigenization of Ownership and Welfare," Journal of Development Economics 13, 331-348, 1983.

Kopits, George F., "Dividend Remittance Behavior Within the International Firm: A Cross-Country Analysis," Review of Economics and Statistics 54, 1972.

Appendix

Variable Definitions

A = total affiliate assets

Dev = dummy variable, equal to 1 for a developed country and 0 otherwise

I = affiliate income, computed as the sum of net income inclusive of foreign income taxes, plus the U.S. prime rate times subsidiary liabilities

I2 = dummy variable, equal to 1 for the manufacturing industry and 0 otherwise

I3 = dummy variable, equal to 1 for the wholesale industry and 0 otherwise

I4 = dummy variable, equal to 1 for the industry of finance (except banking), insurance and real estate and 0 otherwise

I5 = dummy variable, equal to 1 for the services industry and 0 otherwise

I6 = dummy variable, equal to 1 for the category of other industries and 0 otherwise. These are industries other than the petroleum industries and industries denoted by the variables I2 - I5.

L = total affiliate liabilities

P Exp = plant and equipment expenditures by affiliate

R = expenditure for research and development performed for affiliate by parent

T = foreign income taxes of affiliate

W = employee compensation of affiliate

Data Sources:

United States Direct Investment Abroad: 1982 Benchmark Survey Data, 1985.

United States Direct Investment Abroad: Operations of United States Parent Companies and their Foreign Affiliates:

Revised 1983 Estimates
Revised 1984 Estimates
Revised 1985 Estimates
Revised 1986 Estimates
Revised 1987 Estimates
Revised 1988 Estimates

United States Direct Investment Abroad: 1989 Benchmark Survey, Preliminary Results, 1991.

All of the above publications are published by the U.S. Department of Commerce, Washington, D.C. Finally, data on U.S. prime interest rates were taken from the International Financial Statistics of the International Monetary Fund.

TABLE 1. ASSETS OF U.S. AFFILIATES ABROAD (U.S. $ BILLIONS).

	Developed Countries	Developing Countries
1982	144.3	179.7
1983	144.3	187.6
1984	147.6	199.5
1985	166.5	200.4
1986	194.5	197.6
1987	242.5	206.7
1988	258.5	202.6
1989	293.2	218.0

See the Appendix for data sources.

TABLE 2. A COMPARISON OF U.S. DIRECT FOREIGN INVESTMENTS IN DEVELOPED AND DEVELOPING COUNTRIES.

Developed Countries

	T/A	T/I	L/A	P EXP/A	W/A
1982	0.04	0.26	0.63	0.30	0.18
1983	0.05	0.28	0.62	0.29	0.17
1984	0.05	0.28	0.62	0.28	0.22
1985	0.05	0.28	0.63	0.27	0.15
1986	0.05	0.26	0.63	0.26	0.15
1987	0.03	0.22	0.62	0.24	0.14
1988	0.03	0.19	0.65	0.24	0.14
1989	0.02	0.15	0.65	0.23	0.13

Developing Countries

	T/A	T/I	L/A	P EXP/A	W/A
1982	0.07	0.32	0.58	0.19	0.16
1983	0.06	0.39	0.44	0.22	0.14
1984	0.07	0.34	0.55	0.21	0.17
1985	0.06	0.35	0.54	0.21	0.12
1986	0.03	0.25	0.51	0.21	0.13
1987	0.04	0.26	0.50	0.20	0.12
1988	0.04	0.24	0.49	0.20	0.12
1989	0.04	0.22	0.49	0.23	0.12

See the Appendix for variable definitions and data sources.

TABLE 3. MEAN INDUSTRY CHARACTERISTICS ACROSS COUNTRIES--1982.

	T/A	T/I	L/A	P EXP/A	W/A	R/A
All industries	0.07	0.24	0.60	0.09	0.15	0.004
Petroleum	0.10	0.27	0.64	0.14	0.08	0.001
Manufacturing	0.04	0.24	0.59	0.08	0.24	0.009
Wholesale	0.05	0.22	0.64	0.08	0.18	0.002
Finance (except banking),insurance, real estate	0.01	-0.00	0.72	0.00	0.02	0.000
Services	0.03	0.15	0.67	0.10	0.29	0.002
Other Industries	0.03	0.16	0.64	0.07	0.25	0.001

See Appendix for variable definitions and the data source.

TABLE 4. LEVERAGE REGRESSIONS BY COUNTRY: OLS.

	All Countries	Developed Countries	Developing Countries
	(1)	(2)	(3)
C	0.439 (0.056)**	0.331 (.065)**	0.475 (.083)**
T/A	0.463 (.316)	1.649* (.708)	0.380 (.422)
P EXP/A	0.139 (.435)	0.418 (.731)	-0.088 (.617)
W/A	1.017 (.387)**	1.360 (.446)**	1.109 (.770)
R/A	-8.225 (6.913)	-7.946 (5.256)	-18.879 (29.201)
DEV	0.031 (.051)		
R^2	0.26	0.63	0.17
N43	22	21	

Note: The dependent variable is the ratio of liabilities to assets. Standard errors are given in parentheses. * and ** denote significance at the 5 and 1 percent levels respectively. See Appendix for variable definitions and the data source.

TABLE 5. LEVERAGE REGRESSIONS BY COUNTRY: 2SLS.

	All Countries	Developed Countries	Developing Countries
	(1)	(2)	(3)
C	0.423 (.067)**	0.355 (.078)**	0.457 (.086)
T/A	0.666 (.422)	2.055 (.710)**	0.404 (.512)
W/A	0.901 (.290)**	1.450 (.380)**	0.738 (.385)
R/A	-6.437 (6.637)	-10.138 (4.778)*	0.671 (22.058)
DEV	0.068 (.055)		
R^2	0.22	0.47	0.18
N	47	23	24

Notes as for Table 5.

TABLE 6. LEVERAGE REGRESSIONS BY COUNTRY AND INDUSTRY: OLS.

	All Countries	Developed Countries	Developing Countries
	(1)	(2)	(3)
C	0.589 (.072)**	0.573 (.063)**	0.578 (.136)
T/A	0.423 (.333)	1.738 (.572)**	0.281 (.473)
P EXP/A	-0.085 (.277)	-0.777* (.395)	0.077 (.404)
W/A	0.420 (.195)*	0.831** (.202)	0.086 (.375)
R/A	-0.004 (2.801)	-4.296 (4.305)	2.009 (4.625)
DEV	-0.004 (.039)		
I2	-0.114 (.083)	-0.168 (.095)	-0.012 (.151)
I3	-0.049 (.076)	-0.082 (.072)	-0.037 (.146)
I4	0.024 (.076)	0.056 (.073)	(0.013) (.148)
I5	-0.057 (.085)	-0.212 (.092)*	0.031 (.150)
I6	-0.113 (.100)	-0.260 (.091)**	0.061 (.201)
R^2	0.06	0.34	0.03
N	147	75	72

Notes as for Table 5.

TABLE 7. TAX RATE REGRESSIONS BY COUNTRY: OLS.

	All countries	Developed Countries	Developing Countries
	(1)	(2)	(3)
C	0.032	0.029	0.033
	(.028)	(.020)	(.047)
P EXP/A	0.826	0.761	0.892
	(.179)	(.165)**	(.289)**
W/A	-0.431	-0.386	-0.460
	(.186)	(.117)**	(.427)
R/A	3.429	3.016	3.919
	(3.51)	(1.599)	(16.727)
DEV	-0.002		
	(.026)		
R^2	0.40	0.59	0.35
N	43	22	21

Note: The dependent variable is the ratio of foreign income and payroll taxes to assets. * and ** denote significance at the 5 and 1 percent levels respectively. See the Appendix for variable definitions and for the data source.

TABLE 8. INCLUSIVE TAX RATE REGRESSIONS BY COUNTRY: OLS.

	All Countries	Developed Countries	Developed Countries
	(1)	(2)	(3)
C	0.049	0.068	0.071
	(.045)	(.091)	(.043)
P EXP/A	1.034	0.979	1.168
	(.286)**	(1.332)	(.265)**
W/A	-0.046	0.325	-0.823
	(.298)	(0.524)	(.392)*
R/A	3.953	-1.035	39.569
	(5.620)	(7.139)	(15.348)*
DEV	0.048		
	(.042)		
R^2	0.29	0.15	0.56
N	43	22	21

Note: The dependent variable is the ratio of all foreign taxes to assets. * and ** denote significance of the 5 and 1 percent levels respectively. See the Appendix for variable definitions.

ENDNOTES

1. The function f(K) is concave with properties $f' > 0$, $f'' < 0$, $f'(0) = \infty$, $f'(\infty) = 0$.

2. In equation (1), the scrap value S is discounted, as this scrap value is realized after a period.

3. In the present model, maximizing the present value of tax revenues is consistent with maximizing the present value of national income.

4. If the order of these first two events is reversed, then leverage no longer influences the firm's tax liability. In fact, in this case the tax authorities' objective collapses to a problem of static revenue maximization, and there will be no debt finance.

5. This is the case, as domestic taxation other than through incentive effects does not add to national income.

6. The developed countries are Canada, Europe, Japan, Australia, New Zealand and South Africa.

7. Eaton and Gersowitz (1984) indicate that knowledge and management services provided to the affiliate by the parent affect the country's taxation or expropriation decision.

8. The regression for the developing countries does not change materially if the average tax rate is computed as all host country taxes on the firm divided by assets.

9. Of course, there are other possible explanations of a positive correlation between the wage bill and leverage. For instance, a firm that increases the rate of capacity utilization may simultaneously pay more in wages and borrow more to finance additional non-labor production inputs.

10. A potential explanation is that the risk taking incentive problems associated with debt finance are less easily monitored for firms with much plant and equipment.

11. Also, the rates of inflation and indexation provisions that affect the tax advantages of debt finance differ across groups of countries.

12. The petroleum industry pays on average 31 per cent of assets in non-income and payroll taxes per year in the petroleum producing countries. The average non-income and payroll tax is around 9 per cent of assets per year.

13. See Graham and Krugman (1990).

Policy Research Working Paper Series

	Title	Author	Date	Contact for paper
WPS1164	Power, Distortions, Revolt, and Reform in Agricultural Land Relations	Hans P. Binswanger Klaus Deininger Gershon Feder	July 1993	H. Binswanger 31871
WPS1165	Social Costs of the Transition to Capitalism: Poland, 1990-91	Branko Milanovic	August 1993	R. Martin 39026
WPS1166	The Behavior of Russian Firms in 1992: Evidence from a Survey	Simon Commander Leonid Liberman Cecilia Ugaz Ruslan Yemtsov	August 1993	O. del Cid 35195
WPS1167	Unemployment and Labor Market Dynamics in Russia	Simon Commander Leonid Liberman Ruslan Yemtsov	August 1993	O. del Cid 35195
WPS1168	How Macroeconomic Projections in Policy Framework Papers for the Africa Region Compare with Outcomes	Rashid Faruqee	August 1993	N. Tannan 34581
WPS1169	Costs and Benefits of Debt and Debt Service Reduction	Eduardo Fernandez-Arias	August 1993	R. Vo 33722
WPS1170	Job Search by Employed Workers: The Effects of Restrictions	Avner Bar-Ilan Anat Levy	August 1993	D. Ballantyne 37947
WPS1171	Finance and Its Reform: Beyond Laissez-Faire	Gerard Caprio, Jr. Lawrence H. Summers	August 1993	P. Sintim-Aboagye 38526
WPS1172	Liberalizing Indian Agriculture: An Agenda for Reform	Garry Pursell Ashok Gulati	September 1993	D. Ballantyne 37947
WPS1173	Morocco's Free Trade Agreement with the European Community: A Quantitative Assessment	Thomas F. Rutherford E. E. Rutström David Tarr	September 1993	N. Artis 38010
WPS1174	Asian Trade Barriers Against Primary and Processed Commodities	Raed Safadi Alexander Yeats	September 1993	J. Jacobson 33710
WPS1175	OECD Trade Barriers Faced by the Successor States of the Soviet Union	Bartlomiej Kaminski Alexander Yeats	September 1993	J. Jacobson 33710
WPS1176	Cash Social Transfers, Direct Taxes, and Income Distribution in Late Socialism	Branko Milanovic	September 1993	R. Martin 39065
WPS1177	Environmental Taxes and Policies for Developing Countries	Neil Bruce Gregory M. Ellis	September 1993	C. Jones 37699

Policy Research Working Paper Series

	Title	Author	Date	Contact for paper
WPS1178	Productivity of Public Spending, Sectoral Allocation Choices, and Economic Growth	John Baffes Anwar Shah	September 1993	C. Jones 37699
WPS1179	How the Market Transition Affected Export Performance in the Central European Economies	Bartlomiej Kaminski	September 1993	P. Kokila 33716
WPS1180	The Financing and Taxation of U.S. Direct Investment Abroad	Harry Huizinga	September 1993	R. Vo 31047